SELF-POWERING SHOCK, VIBRATION AND ACOUSTIC ISOLATION SYSTEM

Abstract

A shock and vibration isolation system for mounting equipment to a base wall uses a semi-active damper in parallel with a spring arrangement to provide optimum isolation with respect to both shock and vibration. The system comprises a load plate configured for attachment of the equipment thereto and a base plate configured for attachment to the base wall. The base plate is substantially parallel to the load plate. The system further comprises a spring arrangement disposed intermediate the load plate and the base plate. The spring arrangement engages the load plate and the base plate to bias the load plate and the base plate in a separated relationship. A semi-active damper is also disposed intermediate the load plate and the base plate. The a semi-active damper is adapted for providing a selectively variable reaction force to the load plate and the base plate responsive to a relative displacement of the load plate with respect to the base plate. A damper controller is operatively connected to the semi-active damper for controlling the reaction force applied to the load plate and the base plate. The damper controller includes a rechargeable power supply. The isolation system also comprises a recharging arrangement in electrical communication with the rechargeable power supply. The recharging arrangement is mounted to one of the base plate and the load plate and is adapted for converting vibratory motion to electrical energy for storage in the rechargeable power supply.